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## **Secondary Curve Behaviour in Lenke IC Class Adolescent Idiopathic Scoliosis following Video Assisted Thoracoscopic Spinal Fusion**

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### **Introduction**

Ideally after selective thoracic fusion for Lenke Class IC (i.e. major thoracic / secondary lumbar) curves, the lumbar spine will spontaneously accommodate to the corrected position of the thoracic curve, thereby achieving a balanced spine, avoiding the need for fusion of lumbar spinal segments<sup>1</sup>. The purpose of this study was to evaluate the behaviour of the lumbar curve in Lenke IC class adolescent idiopathic scoliosis (AIS) following video-assisted thoracoscopic spinal fusion and instrumentation (VATS) of the major thoracic curve.

### **Methods**

A retrospective review of 22 consecutive patients with AIS who underwent VATS by a single surgeon was conducted. The results were compared to published literature examining the behaviour of the secondary lumbar curve where other surgical approaches were employed.

### **Results**

Twenty-two patients (all female) with AIS underwent VATS. All major thoracic curves were right convex. The average age at surgery was 14 years (range 10 to 22 years). On average 6.7 levels (6 to 8) were instrumented. The mean follow-up was 25.1 months (6 to 36). The pre-operative major thoracic Cobb angle mean was 53.8° (40° to 75°). The pre-operative secondary lumbar Cobb angle mean was 43.9° (34° to 55°). On bending radiographs, the secondary curve corrected to 11.3° (0° to 35°). The rib hump mean measurement was 15.0° (7° to 21°).

At latest follow-up the major thoracic Cobb angle measured on average 27.2° (20° to 41°) ( $p < 0.001$  – univariate ANOVA) and the mean secondary lumbar curve was 27.3° (15° to 42°) ( $p < 0.001$ ). This represented an uninstrumented secondary curve correction factor of 37.8%. The mean rib hump measured was 6.5° (2° to 15°) ( $p < 0.001$ ).

The results above were comparable to published series when open surgery was performed. In one series of posterior surgery (for King II curves)<sup>2</sup> the secondary curve behaviour was as follows: pre-operative mean 32°; post-operative mean 22°; correction 31.3% ( $n=46$ ). Another study of both anterior and posterior surgery (for Lenke IC curves)<sup>3</sup> showed secondary curve behaviour as: pre-operative mean 40.4°; post-operative mean 24.5°; correction 39.4% ( $n=15$ ). A further study of Lenke IC curves<sup>1</sup> demonstrated a pre-operative mean of 44.8°; post-operative mean of 26.8°; correction 41% ( $n=16$ ) when open anterior surgery was performed and a pre-operative mean of 44.4°; post-operative mean of 28.8°; correction 36% ( $n=19$ ) when posterior surgery was performed.

## **Discussion**

VATS is an effective method of correcting major thoracic curves with secondary lumbar curves. The behaviour of the secondary lumbar curve is consistent with published series when open surgery, both anterior and posterior, is performed.

## **References**

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